

**Listing of Claims**

1       Claim 1 (Previously Presented): A method of processing a packet in a gateway device  
2 connected to a plurality of communication paths providing connection with corresponding  
3 networks, said method comprising:

4           providing a search utility in said gateway, said search utility enabling the retrieval of  
5 both a forwarding information and a network address translation (NAT) information  
6 necessary for processing said packet in a single search operation, wherein said NAT  
7 information specifies a new address for an original address in said packet, said forwarding  
8 information specifying one of said plurality of communication paths to forward said packet;

9           receiving said packet containing said original address;

10          determining said forwarding information and said NAT information for said packet  
11 in a single search operation by using said search utility;

12           substituting said new address for said original address in said packet; and

13           forwarding said packet with said new address on the specified one of said plurality of  
14 communication paths in said forwarding information.

1       Claim 2 (Previously Presented): The method of claim 1, wherein said providing  
2 comprises maintaining a single table for both said forwarding information and said NAT  
3 information.

1       Claim 3 (Previously Presented): The method of claim 2, wherein said maintaining  
2 comprises storing said single table in a content addressable memory (CAM) indexed by a  
3 source address and a destination address, wherein said determining comprises providing the  
4 source address and destination address in said packet as a key to said CAM to retrieve said  
5 forwarding information and said NAT information.

1       Claim 4 (Original): The method of claim 3, wherein said CAM comprises a multi-way  
2 CAM.

1       Claim 5 (Previously Presented): The method of claim 2, wherein said gateway device  
2 comprises a service selection gateway (SSG) connecting a plurality of remote systems to a  
3 plurality of service domains, wherein one of said original address and said new address

4 comprises a local address of a remote system and the other address comprises an external  
5 address in a service domain for said remote system, said maintaining further comprises:

6       storing NAT information and forwarding information in a plurality of tables  
7 partitioned according to service domains such that forwarding information and NAT  
8 information related to the same service domain is stored in the same one of said plurality of  
9 tables.

1           Claim 6 (Previously Presented): The method of claim 5, wherein at least one of said  
2 plurality of tables stores NAT information and forwarding information related to at least a  
3 first service domain and a second service domain contained in said plurality of service  
4 domains, said first service domain and said second service domain respectively containing  
5 a first set of addresses and a second set of addresses accessible from said gateway device,  
6 wherein said first set of addresses and said second set of addresses do not overlap.

1           Claim 7 (Original): The method of claim 1, wherein said forwarding information  
2 comprises an interface on said gateway device, wherein said forwarding comprises sending  
3 said packet on said interface, wherein said packet is received in the form of an Internet  
Protocol (IP) packet.

1           Claim 8 (Previously Presented): A gateway device for processing a packet, said  
2 gateway device comprising:

3        interface means coupled to a plurality of communication paths, wherein each  
4 communication path provides connection with a corresponding network;

5        means for searching enabling the retrieval of both a forwarding information and a  
6 network address translation (NAT) information necessary for processing said packet in a  
7 single search operation, wherein said NAT information specifies a new address for an  
8 original address in said packet, and said forwarding information specifying one of  
9 said plurality of communication paths to forward said packet;

10       means for receiving said packet containing said original address;

11       means for determining said forwarding information and said NAT information for said  
12 packet by using said single search;

13       means for substituting said new address for said original address in said packet; and

14       means for forwarding said packet with said new address on the communication path  
15      specified in said forwarding information.

1           Claim 9 (Previously Presented): The gateway device of claim 8, wherein said means  
2      for searching maintains a single table for both said forwarding information and said NAT  
3      information

1           Claim 10 (Previously Presented): The gateway device of claim 9, wherein a memory  
2      means stores said single table in a content addressable memory (CAM) indexed by a source  
3      address and a destination address, wherein said means for determining comprises means for  
4      providing the source address and destination address in said packet as a key to said CAM to  
5      retrieve said forwarding information and said NAT information.

1           Claim 11 (Original): The gateway device of claim 10, wherein said CAM comprises  
2      a multi-way CAM, said packet comprises an IP packet, and said forwarding information  
3      comprises an interface on said gateway device, wherein said means for forwarding sends said  
4      packet on said interface.

1           Claim 12 (Previously Presented): The gateway device of claim 10, wherein said  
2      gateway device comprises a service selection gateway (SSG) connecting a plurality of remote  
3      systems to a plurality of service domains, wherein one of said original address and said new  
4      address comprises a local address of a remote system and the other address comprises an  
5      external address in a service domain for said remote system, said memory means stores NAT  
6      information and forwarding information in a plurality of tables partitioned according to  
7      service domains such that forwarding information and NAT information related to the same  
8      service domain is stored in the same one of said plurality of tables.

1           Claim 13 (Previously Presented): The gateway device of claim 12, wherein at least  
2      one of said plurality of tables stores NAT information and forwarding information related to  
3      at least a first service domain and a second service domain contained in said plurality of  
4      service domains, said first service domain and said second service domain respectively

5 containing a first set of addresses and a second set of addresses accessible from said gateway  
6 device, wherein said first set of addresses and said second set of addresses do not overlap.

1           Claim 14 (Previously Presented): A computer readable medium storing one or more  
2 sequences of instructions for causing a gateway device to process a packet, said gateway  
3 device connected to a plurality of communication paths providing connection with  
4 corresponding networks, wherein execution of said one or more sequences of instructions by  
5 one or more processors contained in said gateway device causes said gateway device to  
6 perform the actions of:

7           providing a search utility in said gateway, said search utility enabling the retrieval of  
8 both a forwarding information and a network address translation (NAT) information  
9 necessary for processing said packet in a single search operation, wherein said NAT  
10 information specifies a new address for an original address in said packet and said forwarding  
11 information specifies one of said plurality of communication paths to forward said packet;

12           receiving said packet containing said original address;

13           determining said forwarding information and said NAT information for said packet  
14 in a single search operation by using said search utility;

15           substituting said new address for said original address in said packet; and

16           forwarding said packet with said new address on the communication path specified  
17 in said forwarding information.

1           Claim 15 (Previously Presented): The computer readable medium of claim 14,  
2 wherein said providing comprises maintaining a single table for both said forwarding  
3 information and said NAT information.

1           Claim 16 (Previously Presented): The computer readable medium of claim 15,  
2 wherein said maintaining comprises storing said single table in a content addressable memory  
3 (CAM) indexed by a source address and a destination address, wherein said determining  
4 comprises providing the source address and destination address in said packet as a key to said  
5 CAM to retrieve said forwarding information and said NAT information.

1           Claim 17 (Original): The computer readable medium of claim 16, wherein said CAM

2 comprises a multi-way CAM and said packet is received in the form of an IP packet.

1           Claim 18 (Previously Presented): The computer readable medium of claim 15,  
2 wherein said gateway device comprises a service selection gateway (SSG) connecting a  
3 plurality of remote systems to a plurality of service domains, wherein one of said original  
4 address and said new address comprises a local address of a remote system and the other  
5 address comprises an external address in a service domain for said remote system, said  
6 maintaining further comprises:

7           storing NAT information and forwarding information in a plurality of tables  
8 partitioned according to service domains such that forwarding information and NAT  
9 information related to the same service domain is stored in the same one of said plurality of  
10 tables.

1           Claim 19 (Previously Presented): The computer readable medium of claim 18,  
2 wherein at least one of said plurality of tables stores NAT information and forwarding  
3 information related to at least a first service domain and a second service domain contained  
4 in said plurality of service domains, said first service domain and said second service domain  
5 respectively containing a first set of addresses and a second set of addresses accessible from  
6 said gateway device, wherein said first set of addresses and said second set of addresses do  
7 not overlap.

1           Claim 20 (Previously Presented): A gateway device for processing a packet, said  
2 gateway device comprising:

3           a plurality of ports, each of said plurality of ports being coupled to a corresponding  
4 one of a plurality of communication paths providing connection with a corresponding  
5 network;

6           a memory unit storing a forwarding information and a network address translation  
7 (NAT) information necessary for processing said packet, wherein said NAT information  
8 specifies a new address for an original address in said packet, and said forwarding  
9 information specifying one of said plurality of communication paths to forward said packet;

10           an inbound interface receiving said packet containing said original address;

11           a forwarding and NAT block determining said forwarding information and said NAT

12 information for said packet using a single search, said forwarding and NAT block substituting  
13 said new address for said original address in said packet; and

14       an outbound interface forwarding said packet with said new address on the  
15 communication path specified in said forwarding information.

1           Claim 21 (Previously Presented): The gateway device of claim 20, wherein said  
2 memory unit stores said forwarding information and said NAT information in a single table.

1           Claim 22 (Previously Presented): The gateway device of claim 21, wherein said  
2 memory unit comprises a content addressable memory (CAM) indexed by a source address  
3 and a destination address, wherein said forwarding and NAT block sends the source address  
4 and destination address in said packet as a key to said CAM to retrieve said forwarding  
5 information and said NAT information.

1           Claim 23 (Original): The gateway device of claim 22, wherein said CAM comprises  
2 a multi-way CAM and said packet comprises an IP packet.

1           Claim 24 (Previously Presented): The gateway device of claim 21, wherein said  
2 gateway device comprises a service selection gateway (SSG) connecting a plurality of remote  
3 systems to a plurality of service domains, wherein one of said original address and said new  
4 address comprises a local address of a remote system and the other address comprises an  
5 external address in a service domain for said remote system, wherein said memory unit stores  
6 NAT information and forwarding information in a plurality of tables partitioned according  
7 to service domains such that forwarding information and NAT information related to the  
8 same service domain is stored in the same one of said plurality of tables.

1           Claim 25 (Previously Presented): The gateway device of claim 24, wherein at least  
2 one of said plurality of tables stores NAT information and forwarding information related to  
3 at least a first service domain and a second service domain contained in said plurality of  
4 service domains, said first service domain and said second service domain respectively  
5 containing a first set of addresses and a second set of addresses accessible from said gateway  
6 device, wherein said first set of addresses and said second set of addresses do not overlap.

1       Claim 26 (Original): The gateway device of claim 25, further comprising a service  
2 selection block determining a specific service to which said packet relates to and causes said  
3 packet to be processed according to a corresponding one of said plurality of tables.

1       Claim 27 (Previously Presented): The gateway device of claim 26, further comprising  
2 a plurality of forwarding and NAT blocks wherein each of said plurality of forwarding and  
3 NAT blocks is coupled to a corresponding one of a plurality of memory units, wherein each  
4 of said plurality of memory units stores one of said plurality of tables.